

## **Nanoporous Platinum for Biomedical Sensors**

Dylan V. Pugh, Sean G. Corcoran  
Virginia Tech  
213 Holden Hall  
Blacksburg, VA  
[dylan@mse.vt.edu](mailto:dylan@mse.vt.edu), [sgc@vt.edu](mailto:sgc@vt.edu)

High surface area electrodes for biosensor technology have been created through the selective dissolution of copper from a Cu70-Pt30 at% alloy.

The extraction of the less noble metal from the alloy is potentiostatically controlled in a 1M H<sub>2</sub>SO<sub>4</sub> electrolyte. The random 3-dimensional, bicontinuous, nanoporous structure was characterized using Small Angle Neutron Scattering (SANS). In the SANS data we can observe a well-defined maximum peak for a given value of Q. This result implies that there is an average ligament width through out the entire 3-dimensional structure; this average ligament size was calculated to be 3nm. The pore size was also measured utilizing a Field Emission Scanning Electron Microscope (FE SEM) to confirm the previous results.

We believe the pore size is a function of electrolyte, temperature, and potential. The average ligament size can be controlled post-formation by coarsening at elevated temperatures.